DoD, Industry, MIT Set Sights on Ensuring Military Might

"Economic Incentives for Systems in Production"

J.C. KREIDEL

According to Wesley L. Harris, bridging the gap between the government and contractors is as simple and as critical as a cultural change. By first developing an open, trusting environment—before producing actual weapon systems—government and contractors can assure warfighters have the very best. It's all about playing on the same team.

He should know. Harris, a respected professor of Aeronautics and Astronautics from MIT, has a long list of credentials, which include Director of the Lean Sustainment Initiative and Co-Director of the Lean Aircraft Initiative.

Harris delivered his presentation, "Economic Incentives for Systems in Production," Jan. 6 at the DSMC Waelchli Room to a group that included the DSMC Commandant, Air Force Brig. Gen. Frank Anderson Jr., and other DSMC faculty.

DSMC has been involved in the project since 1993. Tom Shields, a former DSMC instructor, was a faculty member involved with LAI and continues to work on the project from MIT.

Harris' presentation was built on an LAI-sponsored study that compared six case studies in three categories within the defense aerospace field. The study focused on production programs, and central to the study was determining how production costs could be minimized while allowing contractors a share in the benefits.

FROM LEFT: PAUL MCMAHON, PROFESSOR OF PROGRAM MANAGEMENT AND LEADERSHIP, DSMC, DISCUSSES LAI WITH AIR FORCE BRIG. GEN. FRANK ANDERSON JR., DSMC COMMANDANT, AND WESLEY L. HARRIS, PROFESSOR OF AERONAUTICS AND ASTRONAUTICS, MIT.

Motivation

The driving force behind the study was simple: a win-win solution, with gains for both government and contractors. Getting on the same sheet of paper was the first step. "The need to have a total enterprise view or systems view of what you're doing certainly is well in focus," said Harris. "[What we] want is a bottom line discussion of recommended policy change, based on rigorous research along with a need for a cultural change. How should we do business today for success compared to how we did business prior

***Kreidel** is editor, Program Manager magazine, Division of College Administration and Services, DSMC. A former Sailor, she is a Chief of Naval Information (CHINFO)-award winning writer and editor.*

Photos by Richard Mattox

to acquisition reform is an important question."

The LAI, a consortium of industry, government, labor, and academia, primarily from MIT, provides a neutral forum for change within the defense aerospace arena. From this, members targeted areas for research to better identify lean practices, ultimately producing policy recommendations for those areas deemed ineffective.

These policy recommendations stemmed from study findings and attempted to capture best practices. Importantly, comments from both industry and government, from the top leadership to the shop floor, were included as a means of capturing the total systems view.

One result of this study is the realization that government and contractors shared the same goal, despite adversarial relationships common before acquisition reform. Contractor incentives included pleasing the customer, planning stability and cash flow, while the government counted among its priorities reduced production and life cycle costs, and systems of at least equal performance. Bridging the gap was the objective of maintaining the country's military might with well-equipped warfighters.

An open, trusting environment between customer and contractor could yield a number of tanks or missiles or aircraft or ships at significantly reduced price and related cost savings. An open, trusting environment is priceless. It is the only glue that can [bind] customer and contractor and produce a win-win outcome.

"The big problem before acquisition reform was that the contractual relationship, or the relationship between the contractors and the customer were so bad that the strategies did not lead to the kind of behavior that we wanted," said Harris.

Despite the common goal, contractors found themselves in the difficult position of making do with smaller profits in order to meet customer expectations. Furthermore, when faced with the possibility of adopting customer lean practices, it was only at serious financial losses to themselves. Any cost reductions were "captured" solely by the customer.

Conversely, the government as a customer was unable to encourage contractors to make lean practice changes out of pocket. Harris posed this question: "How do you get a company to invest [its] own funds to become lean if reducing costs means reducing profits?"

Getting to the root of the problem quickly is imperative said Harris as, "Economically incentivized acquisition is not only possible, it is essential to the health of the defense enterprise including customer, contractor, and taxpayer."

Key Questions

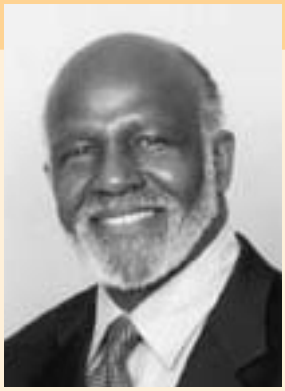
LAI was interested in establishing a common playing field with the customer and contractor working together. With these elements in mind, LAI had the following questions:

- What are the primary strategies, barriers, enablers, and relationships of economically incentivized procurement of weapon systems in production?
- When production costs are reduced, how can contractors share in the benefits?

Lean Aerospace Initiative

- A consortium comprising industry, government, labor, and members from academia.
- A neutral forum for dialogue on change and improvement in the defense aerospace enterprise.
- Identifies lean practices for the defense aerospace enterprise through research and data gathering.
- Produces policy recommendations where current policy and/or practice inhibit the embrace of lean practices.

Wesley L. Harris, Ph.D.



Professor of Aeronautics
Massachusetts Institute of Technology (MIT)

Harris is currently Professor of Aeronautics, Director of the Lean Sustainment Initiative, and Co-Director of the Lean Aircraft Initiative at the Massachusetts Institute of Technology, Cambridge, Mass. Prior to rejoining MIT as Professor of Aeronautics, he served as Associate Administrator for Aeronautics, responsible for all programs, facilities, and personnel in Aeronautics at NASA.

Harris was Vice President and Chief Administrative Officer of the University of Tennessee Space Institute (UTSI) in Tullahoma, Tenn., from 1990 to 1993. From 1985 to 1990 he served as Dean of the School of Engineering and Professor of Mechanical Engineering at the University of Connecticut. Early in his career he held a number of faculty and administrative positions at MIT.

His academic research is associated with unsteady aerodynamics, aeroacoustics, and rarefied gasdynamics. Harris has worked with government and industry to design and build research and development programs, centers, and institutes for the effective transfer of technology. Additionally, Harris is credited with more than 100 technical papers and presentations.

Harris holds a Bachelor of Science degree in Aerospace Engineering from the University of Virginia; and a Master of Arts and a Doctor of Philosophy degree in Aerospace and Mechanical Engineering from Princeton University.

- What practices motivate defense aircraft contractors to invest more of their resources to become lean?
- What are the lessons learned in these studies? Are they transferable to other procurements?

Data Sources

The LAI study compared six case studies in three categories: munitions, airframes, and engines. Research of these projects included over 150 interviews, from all management levels. While it is not LAI policy to publish the names of programs or companies, they did so with written permission. From results presented at LAI workshops, research focused on production programs or as Harris said, "where the real money is made."

LAI considered this a key area where there was room for the greatest improvement. Here the customer sees the largest part of procurement costs and contractors might realize the best opportunity for a return on their investment.

Also important was limiting traditional worrisome areas of technology and funding uncertainty. The assumption is that systems in production have reduced technology, performance requirements, workforce, and budget uncertainties.

Findings

Comparing the findings, LAI discovered many common barriers. With both munitions projects, technical difficulties plagued production. Other factors such as cost overruns, schedule slip, acquisition reform-generated anxiety, and adversarial relationships were a problem. During the faculty forum it was noted these factors probably were not independent and fed off one another. From these facts, LAI noted a need to move from a status quo that nearly meant losing the program to one proactively designed for success.

Technical difficulties also ran rampant within the airframe case studies. Instability was noted in budget and technical requirements areas. Further exacerbating the situation were an adversarial relationship in one airframe case study and a lack of mission for the aircraft in the other.

The engine case studies listed budget instability, non-value added oversight, acquisition reform-generated anxiety, commercial practices-generated anxiety, and increasing unit prices.

Ultimately, LAI distilled a few key barriers, noting that they are the sources of program uncertainty:

- Technical Difficulties
- Budget Instability
- Cost Overruns
- Adversarial Relationships
- Anxieties
- Technical Requirements Instability.

To overcome problems, Harris noted several times the belief that government and contractors should act as one team. Harris' research shows that the primary enablers in economically incentivized contracting are:

- Open, Trusting Environment
- Effective Lean Leadership
- Effective Use of Lean Joint IPTs
- Acquisition Reform.

Results

The adversarial relationships of pre-acquisition reform days can be shed for partnerships of mutual respect and trust, stemming from Integrated Project Teams made up of personnel from both sides — two sides, but one team.

By leveling the playing field, the government and contractors gain several advantages:

U.S. Government

- Technically Sound Systems
- Reduced Cost
- Most Competitive Product
- More Complete Understanding of Contractors' Goals and Constraints
- Potential for Additional Cost Reduction.

Contractor

- Reasonable-Firm Government Commitment
- Reward for Accepting Additional Risk
- Enhanced Corporate Reputation
- Reduced Debt Service
- Government Assistance in Becoming More Lean
- Share in Cost-Reduction Savings.

Recommendations

For successful contracting, Harris and LAI noted that the status quo of perpetuating adversarial relationships and conflicting goals must immediately make way for a jointly beneficial environment where contractor and customer develop a joint cost model and negotiate contracts that meet mutual goals. Toward that end, the LAI recommends the following:

Customer and contractors jointly create shared goals in an environment of mutual respect, trust, and commitment.
By doing so, both sides let go of an "us vs. them" way of thinking and can better focus on shared goals. The first step, said Harris, is ensuring that information is shared openly between respective organizations.

Develop a Joint Cost Model (JCM) for the system in production, as appropriate.
Cooperative teams that utilize current information within known processes and tested technology can better identify procurement costs. LAI suggested using JCMs in all major defense acquisition programs and that both customers and contractors be well-versed in the benefits of JCMs.

Customer and contractor negotiate the contract that meets mutually defined goals while remaining responsive to future uncertainty.
With the cultural changes recommended by LAI, contractor and customer can negotiate contracts that meet both of their goals and needs. LAI specifically identified program managers using insight vs. oversight, being committed to a long-term relationship, and sharing the benefits and risks.

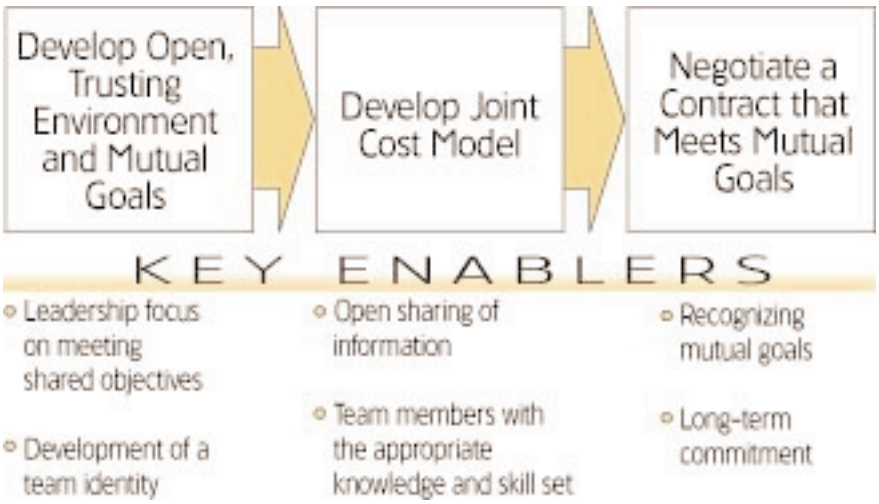
Successful Economic Incentives Result From a Chain of Events

Cultural change or common sense — playing on the same team, and fostering solidarity — breeds fantastic benefits.

"An open, trusting environment between customer and contractor could yield a number of tanks or missiles or aircraft or ships at significantly reduced price and related cost savings," said Harris. "An open, trusting environment is priceless. It is the only glue that can [bind] customer and contractor and produce a win-win outcome."

Editor's Note: Professor Harris welcomes questions or comments concerning this article. Contact him at **weslhar@MIT.EDU**. You may also view the thesis, case study, write-ups, and results briefing at **http://lean.mit/edu/lean**.

Successful Economic Incentives Result From a Chain of Events



OSD Updates *Rules of the Road*

The Under Secretary of Defense for Acquisition, Technology and Logistics; and the Assistant Secretary of Defense for Command, Control, Communications and Intelligence (C3I) recently published online a revised edition of the 1995 *Rules of the Road: A Guide for Leading Successful Integrated Product Teams*.

Designed to assist the Program Manager (PM) and supporting acquisition community in developing and executing high-performance Integrated Product Teams (IPT), this Oct. 1, 1999, update incorporates four years of experience the Department has gained in the IPT process. It also provides guidelines for more effective IPT operations.

In a memorandum to all PMs and IPT members, Dr. Jacques S. Gansler, Under Secretary of Defense for Acquisition, Technology, and Logistics described the Oct. 1 revision as "... a living document that facilitates organizing, leading, and participating in effective and efficient IPTs. The Director, Systems Acquisition, has updated this key guide, and I commend it to every PM and IPT member."

Editor's Note: To download an updated version of *Rules for the Road,* go to **http://www.acq.osd.mil/ar/#sat1** on the Defense Acquisition Reform Web site. For questions or recommendations to improve *Rules of the Road,* contact Dr. Joseph Ferrara, Deputy Director for Acquisition Systems Management, at (703) 614-5420 or E-mail **Ferrarj@acq.osd.mil.**